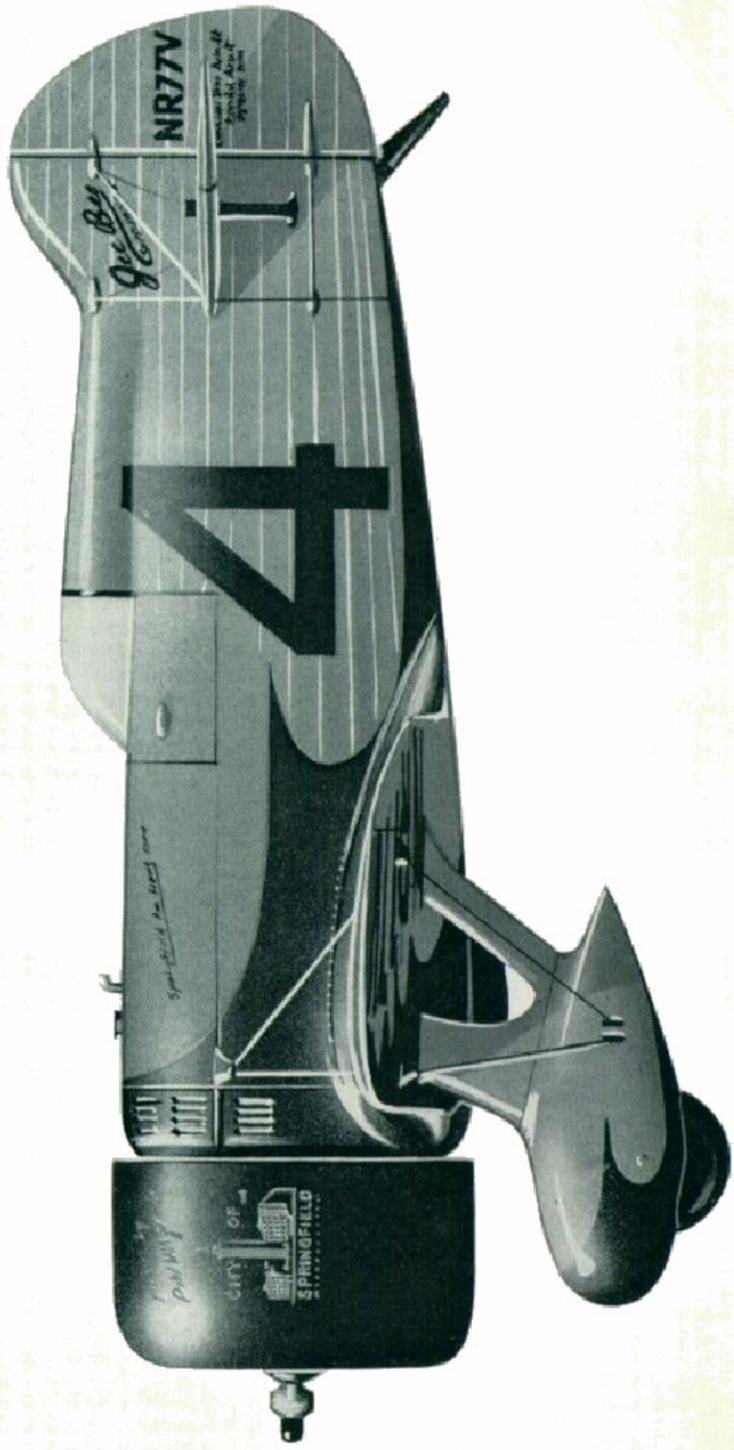
PROFILE
PUBLICATIONS

The Gee Bee Racers



NUMBER 51

TWO SHILLINGS

GEE BEE "SUPER SPORTSTER" (535-h.p. Pratt & Whitney Wasp Jr.).

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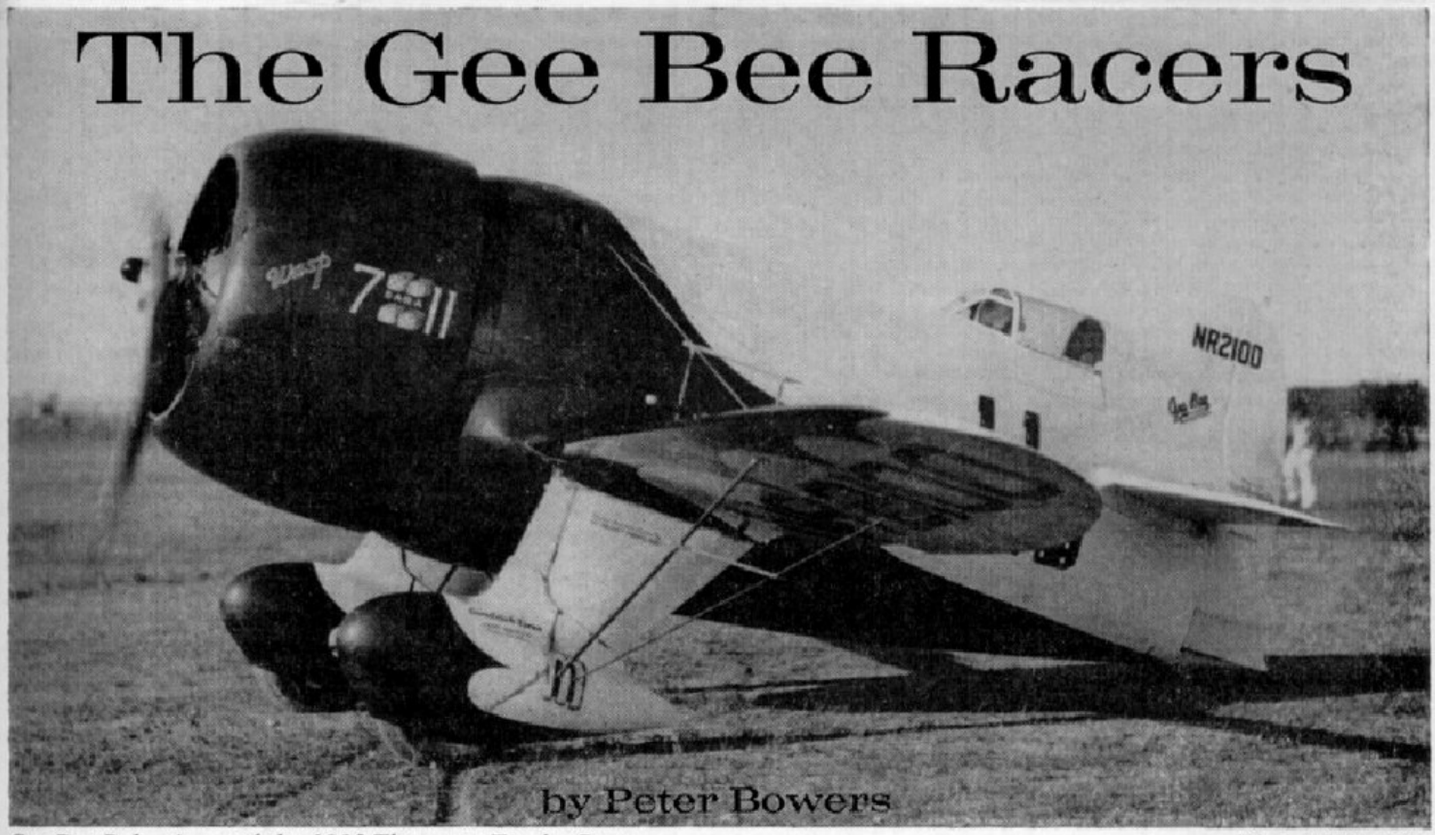
"City of Springfield", flown by Lowell Bayles to win the 1931 Thompson Trophy Race at 236·2 m.p.h. average speed.

The Gee Bee Racers



by Peter Bowers

Gee Bee R-1, winner of the 1932 Thompson Trophy Race. (Photo: U.S.A.F.)

The position of the Gee Bee racers in aviation history is unique. If one considers the 1931 and 1932 Super Sportsters to be essentially one basic design, it is safe to say that no single model in air racing history has ever made such a spectacular entrance upon the scene or attained such a dominant place in the memory and affection of the racing enthusiasts. This is all the more remarkable because the significant racing history of the three most famous machines lasted barely more than one year. Other designs, notably the contemporary Wedell-Williams series, turned in dependable performances year after year and amassed a far greater total of winnings. However, the Wedell-Williams is relatively unknown today while the stubby Gee Bees are almost invariably the first machines that come to mind whenever the spectacular 1930–39 period of American air racing, generally referred to as "the Golden Years", is mentioned.

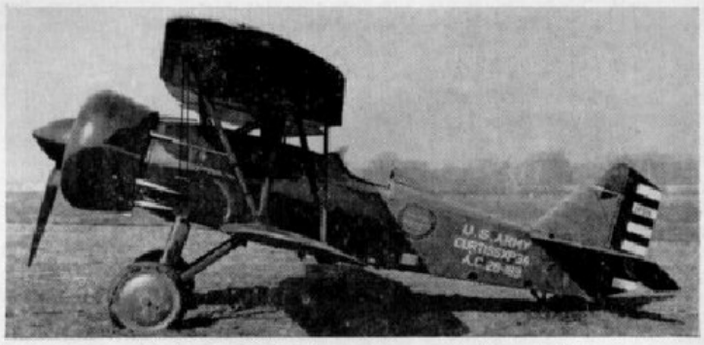
AMERICAN AIR RACING

An understanding of how the phenomenon of the Gee Bees could come about can be obtained from a review of the previous decade of air racing in America. Aeroplane races had become a very popular spectator sport both in Europe and in America in the years before W.W.I, and was, in fact, one of the major public activities in those years when aviation had not yet become a significant part of the military and commercial scene. The major aircraft-producing countries of the world, most notably France, conducted race meetings and specific annual contests that were to become world famous. W.W.I, of course, put an end to such sporting activity, but it was revived with even greater enthusiasm in 1919, the first post-war year. The nature of the machines and the participants had changed greatly, however. No longer was it a rich sportsman's activity, conducted in the atmosphere of a top social event. Aviation had become an established industry and the details of the machines were dominated by military considerations. The first crop of post-war racers was composed entirely of cleaned-up wartime fighters or similar airframes powered with war-developed engines. Because of the greater power and general complexity of the machines, costs were high and the sportsman pilot who paid the purchase and maintenance costs of his own machine was soon driven out of the high-performance field. Entries in the big-name races for machines with unlimited power—the Schneider, Gordon-Bennett, and Pulitzer, were largely limited to syndicates, governments, and large and well-established manufacturers. The sporting pilots had to content themselves with lower-powered war-surplus machines in the 80–200-h.p. range that were better suited both to their pocket-books and their piloting capabilities.

While many races were held in Europe, they were quite different from those in America, where a combination of technical, economic, and geographic circumstances peculiar to that large nation soon produced the phenomenon of the annual "National Air Races". By the mid-1920s, this had become an established institution that covered a period of a week to ten days and included competitive events for pilots possessing practically any known kind of aeroplane and the urge to enter it in competition. Of course, the unlimited power events were still the domain of the military, but the sportsmen had a practically unlimited choice in the lesser events that included everything from motor-cycle engines up to a practical limit of around 300 h.p. Especially popular with the private pilots were races for specific models of commercial aircraft, or at least for those using the same powerplant. In these, the owners of stock models could have all the thrills of competition without the terrific expenditures of time and money involved in producing a specialised racer. It was through this channel of relatively economical and low-powered racing events that the name of Gee Bee entered the aviation Hall of Fame in 1930.

THE GRANVILLE BROTHERS

The name "Gee Bee" is a spelling-out of the initials G.B., standing for Granville Brothers Aircraft, Incorporated. There were five brothers in the manage-



The changing fashion in racers. Left: *The Travel Air "Mystery Ship", winner of the 1929 Pulitzer race and first civilian racer to beat the military.* Right: *The Curtiss XP-3A that was placed second.* (Photo: U.S.A.F.)

Left: *The original Gee Bee Model "X" of 1930 with inverted Cirrus engine. Note that the landing gear is rigid and that flying wires are attached to the ends of the wheel axles. All shock absorbing is accomplished by the fat Goodyear airwheels.* Right: *Gee Bee Model "E", radial-engined version of the original "X". Flying wires now attached to a point behind the wheels, which are mounted on shock absorbers.* (Photos: Granville)

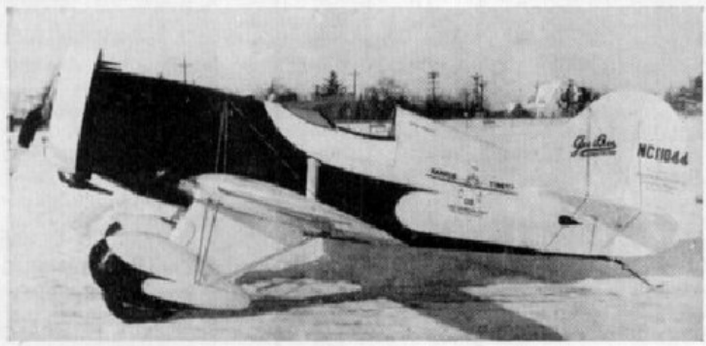
ment of a firm that had developed out of an itinerant aircraft repair business founded by Zantford Granville at Boston, Massachusetts, in 1925. Caught up in the spectacular growth of aviation that followed Lindbergh's flight from New York to Paris in 1927, the business expanded to the point where it became a formal corporation engaged in the manufacture of commercial aeroplanes at Springfield, Massachusetts. The first product of this new firm was the Gee Bee Model "A", a small two-seat biplane that differed from its contemporaries only in the seating arrangement, which placed the occupants side-by-side in a single cockpit instead of in the traditional two tandem cockpits.

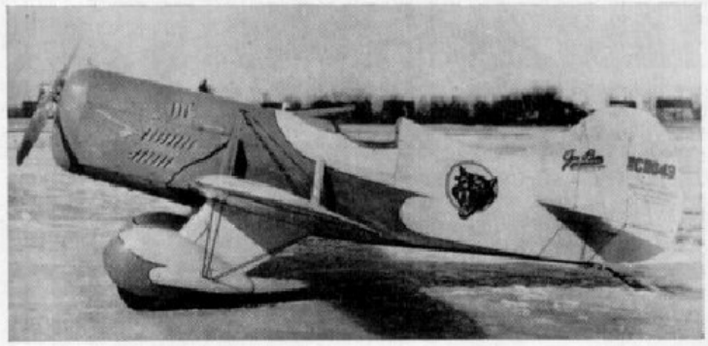
THE GEE BEE SPORTSTERS

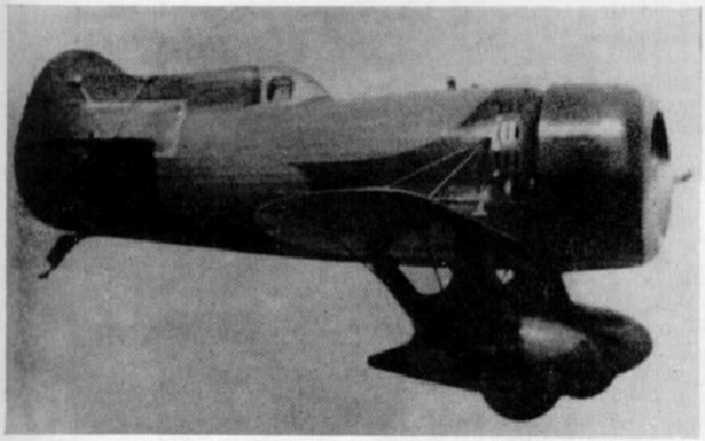
The trends established by recent American racing-places influenced the next Gee Bee design, the Model "X" "Sportster" of 1930. This was a single-seat monoplane powered by a 110-h.p. American Cirrus engine, a four-cylinder, inverted, air-cooled design. In 1929, for the first time, a commercial product had beaten the military in unlimited racing. The brand-new Travel "Mystery Ship", a low-wing monoplane with wire bracing and only a 300-h.p. Wright J-6-9 "Whirlwind" engine but very careful streamlining, won the last (1929) running of the Pulitzer race against a slightly cleaned-up standard Curtiss P-3A "Hawk" Army pursuit plane. Although a biplane was to win again in 1930 (the Thompson Trophy Race replaced the Pulitzer as the top unlimited event at the National Air Races), the end of the biplane era of racing had definitely arrived. Most subsequent racers and a number of commercial designs followed the lead of the Travel Air and adopted the low-wing configuration with wire bracing. This new style dominated the races until history repeated itself and the 1936 Thompson was won by a more up-to-date design that again beat the standardised monsters with lower power and improved streamlining. Michel Detroyat's Caudron C.460 featured not only a sleek cantilever wing but a great reduction in drag through use of a retractable landing gear.

The new Gee Bee Model "X" was intended as a relatively low cost and docile sporting machine and was not intended to be a racer. However, circumstances soon made a racer of it. The "Sportster" was designed to meet full commercial licensing requirements and many were sold with "standard" licences, free of the limitations and restrictions imposed on all-out racers. The machines that were used for racing frequently incorporated minor modifications and

Left: *Final landing gear configuration of the Gee Bee "Sportster" series. This Model "E" carries the NC lettering of a full commercial licence.* Right: *This Menasco-powered "Sportster" was frequently called the X-5 in spite of the fact that those aircraft with in-line engines had become known as Model "D" while those with radial engines were known as Model "E". This particular machine was raced under its commercial licence.* (Photos: Granville)







Early flight photo of the 1931 Model "Z" before application of registration or racing numbers.
(Photo: P. M. Bowers' collection)

increases over the original power ratings that invalidated their "standard" category certification and put them in the "Restricted" class as indicated by the letters NR instead of NC in front of their registration numbers.

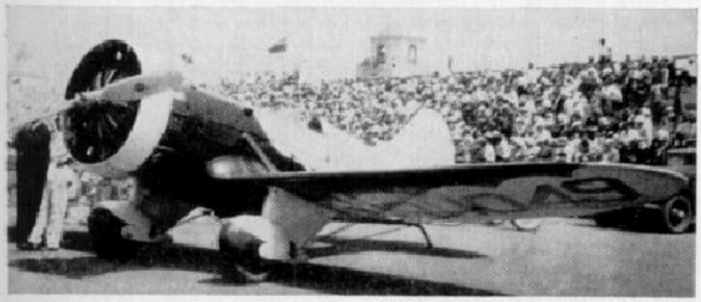
The structure was strictly standard for the time, with welded steel tube fuselage and tail surfaces and wooden ribs and wing spars with fabric covering over all. The basic aerodynamic and structural concepts of the "Sportsters" were retained for all succeeding Gee Bee designs.

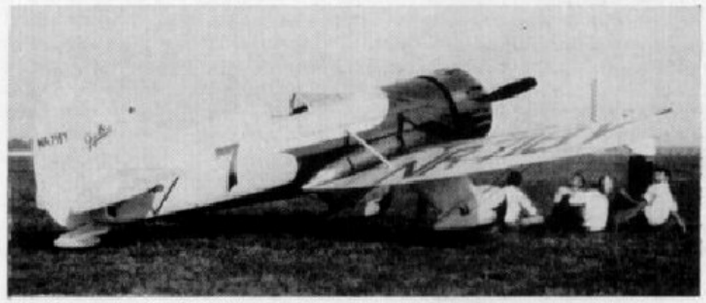
While originally known as Gee Bee Model "X", the single-seaters soon became known by other designations to distinguish them by powerplant. Model "D" used inverted in-line engines such as the 95- or 125-h.p. Menasco, the 110-h.p. Cirrus, or the 135-h.p. Ranger. Model "E" used the 110-h.p. Warner Scarab radial. The first of the line, still called Model "X" and powered with the Cirrus, was entered in the 1930 American Cirrus Derby by Lowell Bayles of the Brinton-Bayles Flying Service, also of Springfield. This was quite different from the usual concept of an air race, being in the form of a tour for aeroplanes powered with any of several variants of the sponsor's basic engine. The participants were to fly a 5,541-mile route from Detroit, Michigan, the motor capital of the country, penetrate the Deep South and as far west as Los Angeles, and then return to Detroit. This event was conducted independently of the National Air Races and was intended to demonstrate to the public the dependability of modern commercial aircraft, particularly those powered with Cirrus engines. While the speed aspect was present, and a pure racer had the shortest elapsed time, the majority of the machines entered were only slight refinements of standard production models. Bayles' Model "X", registered *NR-49V*, placed second to a somewhat similar wire-braced monoplane, the Command-Aire "Little Rocket" which was so named because it was built in Little Rock, Arkansas.

The successful showing in the Cirrus Derby resulted in booming business for the little Granville shop, and minor variations of the prototype soon rolled out of the door. None of these machines was a true production article, however. Each was built practically as a custom model and refinement of the basic design became apparent as each succeeding airframe took shape. These are pointed out in the photographs while specifications for all of the Gee Bee monoplanes are presented in a single table at the end of this *Profile*.

THE SENIOR SPORTSTERS

With a successful line of single-seaters in production, it was logical that the basic design be expanded to a two-seater. This was done with the Model "Y", two of which were built. The first, registered *NR-11049*, was merely a logical expansion of the "X". Span was increased five feet and the fuselage was lengthened four and a half feet to accommodate the extra cockpit, larger fuel tank, etc. For racing purposes, the front





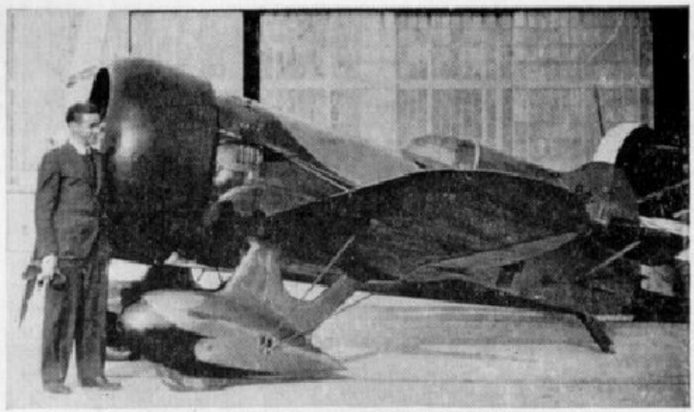
Left: *The first Gee Bee Model "Y", modified from its original 1930 configuration by installation of a Pratt & Whitney "Wasp" engine and revision of the landing gear. Shown here while participating in the 1933 National Air Races.* Right: *Final form of the second Model "Y", fitted with Wright "Whirlwind" engine and entered in the 1933 National Air Races.*
(Photos: A. U. Schmidt collection)

Left: *Gee Bee Model "Z" in full markings. The apparently lighter colouring compared to the other photos is the result of this photo being taken with panchromatic film and a yellow filter while the others were taken on orthochromatic film, which makes yellow appear much darker.* (Photo: Granville.) Right: *Designer Bob Hall after winning the 1931 General Tire & Rubber Trophy. Note the fabric fairing between the landing gear struts, used during this race only.* (Photo: U.S.A.F.)

cockpit could be covered over to reduce drag. The original powerplant was a 300-h.p. Pratt & Whitney "Wasp Jr.". This was good enough to result in a first place in the Aerol Trophy Race for women in the 1931 National Air Races for Maude Tait. Winning speed was 187 m.p.h. A larger 420-h.p. P. & W. "Wasp" was installed for subsequent races.

The second Model "Y", registered *NR-718Y*, was originally powered with a 215-h.p. Lycoming R-680 radial engine and was used as an engine test-bed by Lycoming. It was purchased in 1933 by a new owner, Art Knapp, who installed a 420-h.p. Wright J-6-9 "Whirlwind". This, too, was a good lady's machine, being flown to second place in the women's Free-for-All at the 1933 Chicago races by Florence Klingensmith, at a speed of 189·04 m.p.h. She was killed in a later event at Chicago when the "Y" began shedding wing fabric and then broke up in the air. The first "Y" was lost under slightly less spectacular circumstances —a propeller blade came off during a flight over the ocean near New York City. The resulting vibration soon tore the engine from its mounting and the plane spun into the Atlantic.

During their brief racing careers, both of the "Y"s demonstrated a technical trend that was characteristic of American racing planes in the 1930s. A single machine would enter the races several years in a row but would be practically a different aeroplane each time. This was because extensive modifications were frequently made to improve streamlining and enable older designs to catch up with the latest improvements introduced on the newer models. The most common change, of course, was to put in an engine of greater horsepower. While the added power did increase the top speed, it also introduced other problems that all too often spelled the doom of the machine and its pilot through overstressing of the structure, changing the balance, etc. The Gee Bees are outstanding examples of the consequences of this practice.

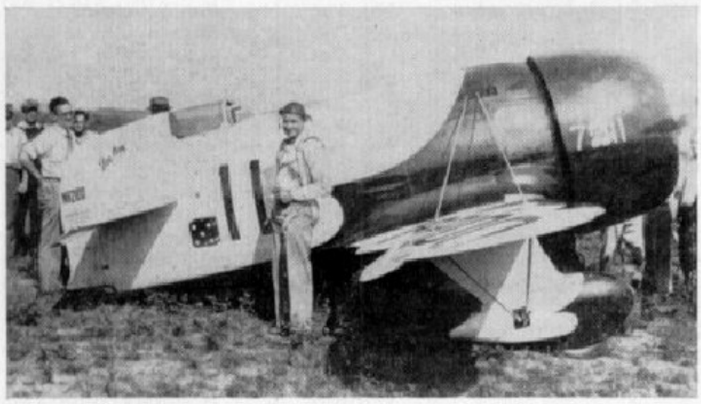


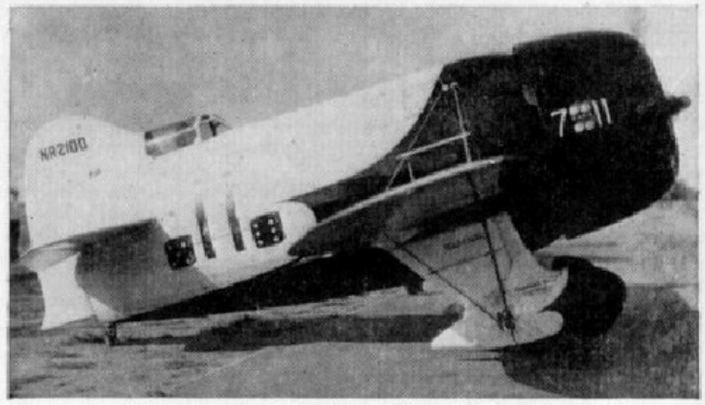
Final configuration of the Gee Bee Model "Z", fitted with larger P. & W. "Wasp" engine in place of the original "Wasp Jr.". The "Wasp" was installed for the ill-fated attempt on the land-plane speed record in December 1931.
(Photo: Courtesy Charles G. Mandrake)

THE SUPER SPORTSTERS

Since the Sportsters had done so well as racers without actually being designed for the purpose, it was logical for the Granvilles to consider the development of a pure racer that would be capable of going after the bigger prizes in the unlimited power events. While the company and the individual owners of Gee Bee aircraft had been able to meet the costs of entering the small machines in the races, it was recognised that the cost of an unlimited racer was beyond the resources of the small firm, especially in the second year of the world-wide economic depression that had already forced some old established aircraft manufacturers into bankruptcy. Consequently, a syndicate known as the Springfield Air Racing Association was formed in July 1931, to finance the development of the new racer.

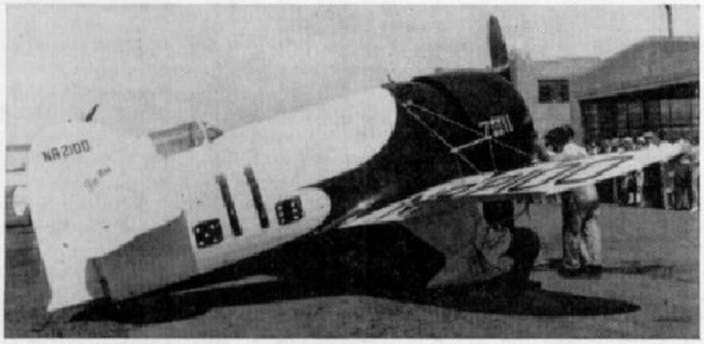
MODEL "Z". This was a direct descendant of the "X" and "Y" models, using the same general lines and construction details. However, it leaned more heavily

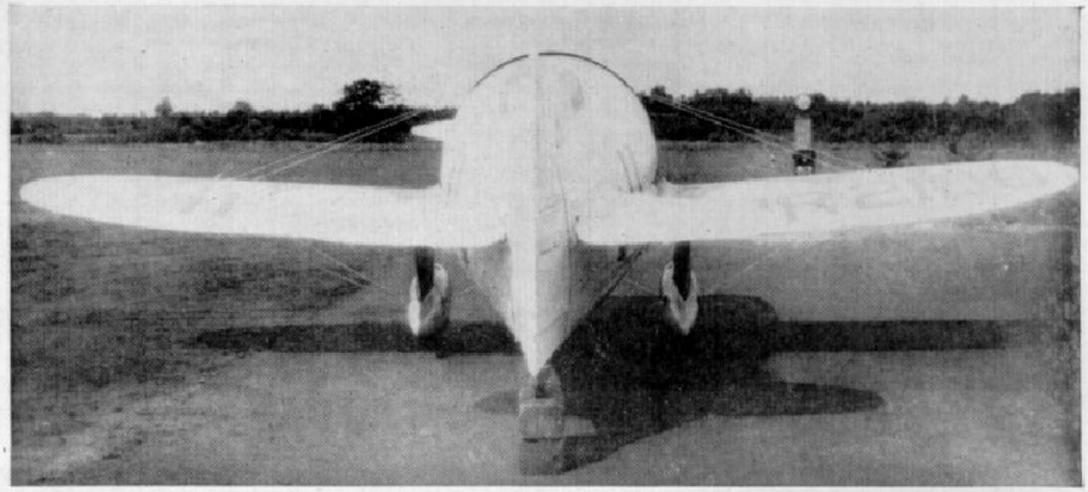




Left: *Original version of the 1932 Model R-1. Note the absence of a conventional vertical fin. The pilot is Russell Boardman.* (Photo: Courtesy Charles G. Mandrake.) Right: *Modified 1932 version of the R-1 with vertical fin and increased rudder area.*
(Photo: U.S.A.F.)

Left: *The R-1 at Cleveland Municipal Airport for the 1932 National Air Races, where it won the Thompson Trophy Race and set a new Shell Speed dash record of 296·287 m.p.h.* (Photo: Courtesy Charles G. Mandrake.) Right: *1933 version of the R-1 with P. & W. "Hornet" engine and increased vertical tail area.*
(Photo: E. M. Sommerich collection)





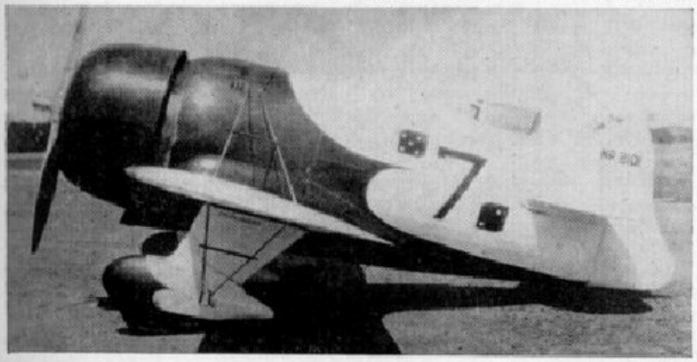
Rear view of the Gee Bee Model R-1, showing the completely circular cross-section of the fuselage forward and the extreme width of the rudder at the tail post.
(Photo: Granville)

on a particular feature of the 1929 Travel Air "Mystery Ship" than had any previous Gee Bee other than the second Model "Y". The cross-section of the fuselage was enlarged to match the diameter of the radial engine and continue the lines of the new N.A.C.A. cowling aft for improved streamlining. Prior to the appearance of the Travel Air, the cylinders of radial engines projected beyond the fuselage line and drag rings or cowls, when they were added after those devices were developed, looked like thick horse collars on the relatively slim fuselages of the time. The Travel Air changed this, but the early Gee Bees followed the old horse collar concept. The Model "Z" followed the Travel Air example, and at first glance seemed to expand upon it. Since the special hopped-up "Wasp Jr." engine had a diameter of 46 inches, resulting in a cowl diameter of over four feet, and the fuselage of the "Z" was over a foot shorter than that of the standard single-seat Sportster, the result was a barrel-like body unlike anything seen before. Most traditional racers, which had been developed around compact vee and in-line engines, were built with the smallest possible fuselage cross-section to reduce parasite drag. The early radial-engined racers merely fitted the large-diameter engine to the standard thin fuselage until the appearance of the Travel Air.

Pilot Lee Gehlbach and the Gee Bee R-2, which differed from the R-1 in having a smaller P. & W. "Wasp Jr." engine and increased tankage for cross-country racing.
(Photo: Courtesy Charles G. Mandrake)

Streamlined objects above the tail registration numbers and on the wingtips of the R-2 are lights to permit night flying during cross-country races.
(Photo: Courtesy Charles G. Mandrake)

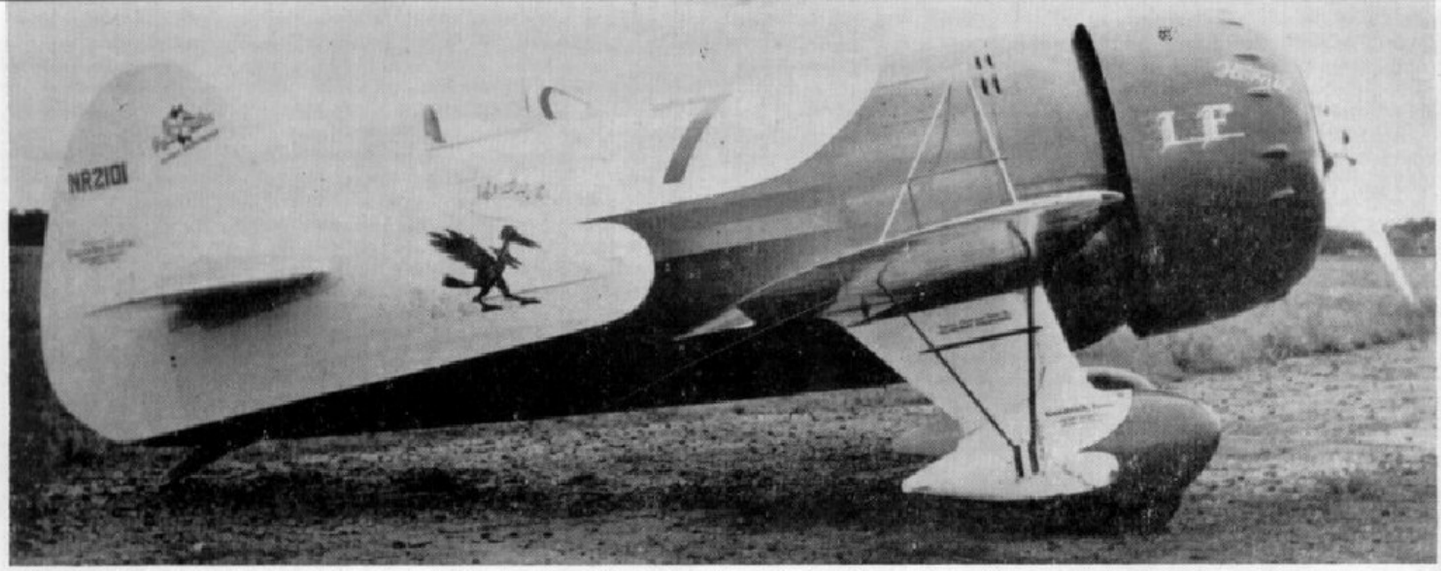
1933 version of the R-2 with engine and cowl from the 1931 version of R-1, new wing and enlarged vertical tail surfaces.
(Photo: P. M. Bowers' collection)



The combination of a heavy engine and a short fuselage was responsible for another unconventional feature of the new Gee Bee. To offset the weight of the engine, it was necessary to move the pilot considerably aft of his normal position on or just behind the centre of gravity. He ended up so close to the tail, in fact, that it was a simple matter to integrate what would normally be the streamlined headrest behind an open cockpit into the vertical fin. A seemingly new feature of the Model "Z" was the use of a completely enclosed cockpit for the pilot. This had appeared on racers as far back as 1920, but had not been accepted as a standard feature. As better streamlining and increased protection of the pilot from the elements became necessary when speeds neared 200 m.p.h., the need for complete enclosure became apparent.

Another characteristic of racing planes the world over, especially new models, is that they are seldom ready sufficiently in advance of the race to permit a careful programme of testing and adjustment. The fact that the Gee Bee "Z" made its first flight on 22nd August 1931 when the races were scheduled to start on 29th August, is a production miracle because design and construction had only begun early in July! Fortunately, there were few teething troubles for the new model.

Painted yellow and black in the now-traditional Gee Bee pattern and assigned racing number 4, the hope of the Springfield Air Racing Association was christened "City of Springfield". With this name and a painting of prominent Springfield buildings on each side of its nose in gold, the short but spectacular career of No. 4 opened with four first places in four events entered at the National Air Races and a new record in the speed dashes. Two pilots flew the stubby little speedster—designer Bob Hall winning the General Tire & Rubber Co. Trophy at 189·545 m.p.h. and a mixed Free-for-All at 222·263 m.p.h. Lowell Bayles, pilot of the original Model "X" in the previous year's Cirrus Derby and one of the major stockholders of the Association who had "bought in" for the specific



In 1934 the wrecks of the R-1 and R-2 were rebuilt into a single aeroplane named the "Intestinal Fortitude" which was given the registration and racing numbers of the R-2. (Photo: Granville)

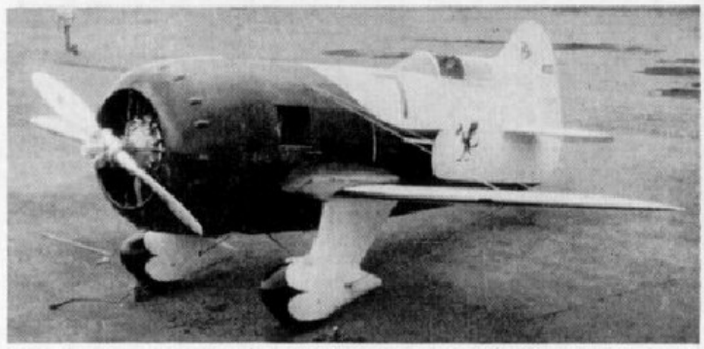
purpose of flying the new racer, won the Goodyear Trophy at 206·001 m.p.h.; the major event, the Thompson Trophy Race, at 236·239; and set a new event record of 267·342 m.p.h. in the straightaway Shell Speed dash. An official attempt by Bayles on the official three kilometre world land-plane speed record was terminated when the engine lost power and he decided to save the machine for the Thompson Race to be held later the same day.

With the major races over for the year, the Granvilles and the Racing Association turned their thoughts to another try for the land-plane speed record. The Model "Z" had shown that it could do no more with the original "Wasp Jr." engine, so the logical step was taken—a larger 1,340 cubic inch Pratt & Whitney "Wasp", normally rated at 450 h.p. but boosted to 750 h.p. for the record attempt, was installed. Because of the larger diameter, it was necessary to fit a larger cowling that changed the forward lines of the machine. It was flown to Detroit for the record attempt, and several dashes were made that exceeded the record, one to a dazzling 314 m.p.h. For various technical reasons, however, it was impossible to complete the four passes required on a single flight. One attempt failed through no fault of the aeroplane—the recording equipment failed so the record flight could not be declared official.

The last attempt, on 5th December 1931, made headlines by being a spectacular failure. When the plane was passing the cameras at maximum speed, it is believed that the cap on the fuel tank came off, shattering the windshield and startling or injuring Bayles, the pilot, so that he made a sudden movement of the controls that overstressed the machine and caused it to disintegrate. One wing folded back, causing the plane to do a violent series of rolls that continued until it hit the ground in a near-level attitude. This unfortunate event was perpetuated in a rather classic example of the exploitation of death and misfortune for profit—the entire episode had been recorded by the newsreel cameras, and this footage was spliced into a number of subsequent aviation films when a fiery crash was to be depicted.

THE R-1 AND THE R-2. Although the loss of Bayles and the Model "Z" was a blow to the Association, the record of the aeroplane's performance, and its profits, proved the design to be sound. With full expectation of being able not only to duplicate but exceed the 1931 performance record, the Association decided to build not one but two new models for the 1932 season. The improved versions, designed without the services of Bob Hall, who had joined a new racing association, were designated R-1 and R-2. Except for powerplants, the two were aerodynamically and structurally identical. The R-1, registered *NR-2100* and carrying racing number 11, was powered with a "Wasp" boosted to 800 h.p. while the R-2, with registration *NR-2101* and racing number 7, carried a smaller "Wasp Jr." delivering 550 h.p. The R-2 had increased tankage since it was planned for use primarily as a cross-country racer while the more powerful R-1 was a pylon racer. The R-1 became the most famous of all the Gee Bees and its pictures are used most often to illustrate "The Gee Bee".

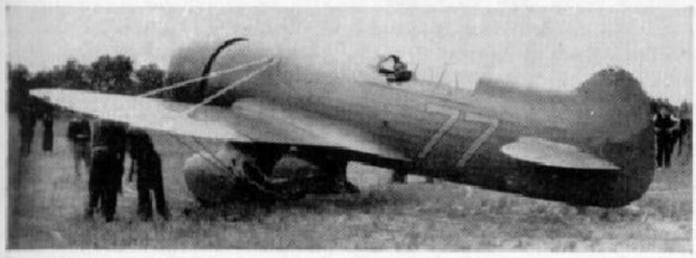
Construction of the "R"s was very similar to that of the "Z" and its predecessors except that in the interest of greater strength and improved airflow the wings and horizontal tail surfaces were covered with plywood. The landing gear struts were faired in like those of the later Sportsters and the modified versions



The R-1/R-2 hybrid did not fly in the 1934 National Air Races because of damage sustained in a pre-race accident. (Photo: E. M. Sommerich collection)

The 1935 version of the R-1/R-2 as modified by new owner Cecil Allan. Major change was the installation of a larger wing. (Photo: A. U. Schmidt collection)

The Q.E.D. being prepared for the 1934 MacRobertson race from England to Australia.
(Photo: E. M. Sommerich collection)



The Q.E.D. of 1934, not a true racing plane but used almost exclusively for that purpose.
(Photo: Courtesy Major Richard R. Sheak)

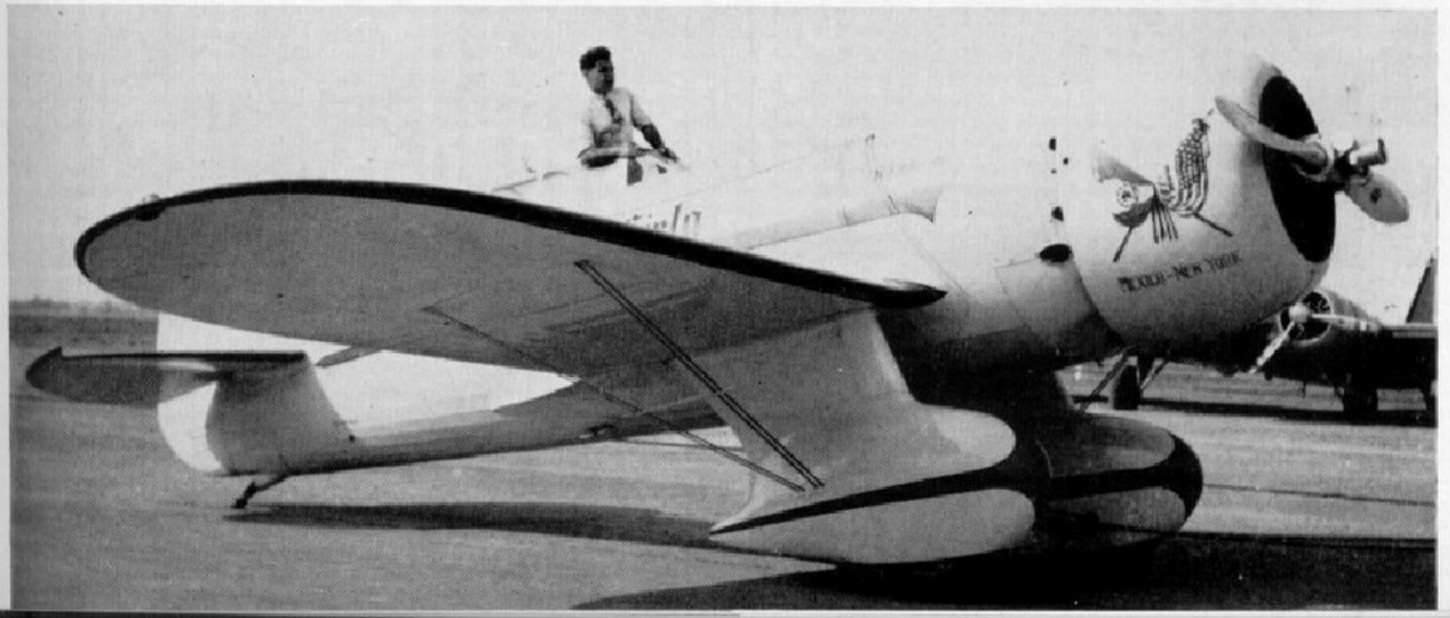
of the "Y". Both the overall length and the wingspan were increased over those of the "Z", but the fuselages were even fatter and the pilot was moved still farther aft and closer to the tail. As originally built, the traditional vertical fin was non-existent on the R-1. The cockpit canopy faired directly to the top of the rudder in a horizontal line. While this was an oddity of configuration, the rest of the features being in the established Gee Bee tradition, the R-1 did have a most important new feature—a propeller with controllable pitch. Previous racers had all used fixed-pitch designs which had to be set at a compromise adjustment to accommodate the important take-off as well as the high speed performance. A propeller that could be readjusted in flight gave both better take-off performance and a higher top speed.

The first flight was made on 13th August 1932. The pilot was Russell Boardman, who had become the major stockholder and manager of the Association. As a result of directional instability on this flight, a small vertical fin similar to that of the Model "Z" was added and the rudder area was increased. Boardman was to pilot the R-1 in the 1932 National Air Races, but was injured in the crash of a Sportster during the test programme. On 27th August, after his own cleaned-up Laird biplane racer was eliminated from competition by a wheels-up landing during a test flight, famed racing pilot Jimmy Doolittle, winner of the 1925 Schneider Trophy, the 1931 Bendix, and later to achieve W.W.II fame as leader of the 1942 Tokyo Raiders, agreed to pilot the R-1 in the Thompson Trophy Race. On his first flight in the machine, Doolittle flew it from Springfield to Cleveland, where the races were to be held. On 3rd September he set a new land-plane speed record of 296·287 m.p.h. over the three kilometre Straightaway course and two days later won the closed-course Thompson at a new record speed of 252·686 m.p.h.

The 1932 Thompson was to be the only race that the R-1 would win. It was improved for the 1933 races through the installation of a larger Pratt & Whitney "Hornet" engine delivering 900 h.p. and the rudder area was increased. Since the National Air Races were to be held in Los Angeles that year, with the transcontinental Bendix Trophy Race starting in New York, the R-1 was entered in the cross-country as well as the pylon event. Russell Boardman had recovered from his 1932 injuries and was the pilot. When taking-off from Indianapolis, Indiana, his first fuel stop on the route, the R-1 suddenly went out of control and crashed upside down. Boardman succumbed to his injuries a few days later and the career of the R-1 was ended in its second race. Parts were salvaged, however, to fly in other races.

Because of its smaller engine, which resulted in a more sharply tapered cowling, the R-2 could be distinguished from the R-1 by this feature as well as by its different numbers and the arrangement of the unique "Pair of Dice" insignia. Since it was completed several days after the R-1, the R-2 benefited from the R-1 test flight and had the extra fin and rudder area added before it flew. It was entered in the 1932 Bendix Trophy Race, which started in Los Angeles and ended in Cleveland. Piloted by Lee Gehlbach, who had beaten the original Gee Bee Model "X" in the 1930 Cirrus Derby, the R-2 was leading the field when it was forced down at Rantoul, Illinois, by an oil leak. Since it couldn't be repaired in a reasonable time, Gehlbach flew on to Cleveland with the cockpit canopy removed so that he could see around the oil-covered windshield. In spite of the delay and reduced

The Q.E.D. as it appeared in 1939 with a new owner and new colours. For the first time, it carried a given name—"Conquistador del Cielo"—"*Conqueror of the Skies*".
(Photo: E. M. Sommerich collection)



speed, he was placed fourth. The same pilot and plane were placed fifth in the Thompson Trophy Race, a creditable performance considering the lower power when compared to the winning R-1 and some of the other contestants. The R-2 was also placed third in the Free-for-All for aeroplanes powered with engines under 1,000 cubic inches (the "Wasp Jr." displaced 975 cubic inches). These were the only places taken by the R-2 in air racing.

Like the R-1, the R-2 was improved for the 1933 season. It inherited the original "Wasp" engine and cowling of the R-1 and was fitted with a new and larger wing that was equipped with flaps. The R-2 was piloted in the 1933 Bendix race by Russell Thaw and beat the R-1 to Indianapolis, where it suffered wing-tip damage during a rough landing. However, while the damage was easily repairable, Thaw withdrew from the race after Boardman's accident and the R-2 did not continue to Los Angeles for the pylon events. The R-2 was demolished later in 1933 when another pilot, James Haizlip, lost control during a landing and the machine cartwheeled end-over-end.

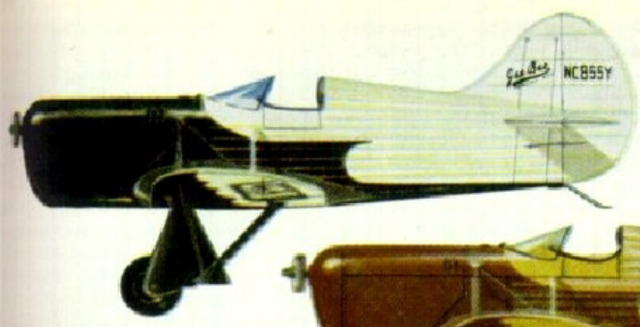
THE R-1/R-2 COMBINATION. Another amazing facet of American air racing is the many miracles of reconstruction that were accomplished. While both the R-1 and the R-2 were reduced to apparent junk in 1933, enough usable parts of each remained to form one complete new airfame. A major asset was the complete 1932 wing of the R-2, which had been stored since the replacement was installed. This wing was mated to the repaired R-1 fuselage, which had been lengthened two feet in the process and fitted with a larger fin and rudder. A "Hornet" engine was installed as in the 1933 version of the R-1, but a closer-fitting cowl was used which necessitated a row of distinctive bumps to accommodate the cylinder rocker boxes. This hybrid machine was given the registration and racing numbers of the R-2, but did not carry the now famous dice insignia nor the S.A.R.A. initials of the Springfield Air Racing Association, that organisation having been dissolved. The Granville organisation itself undertook the costs of reconstruction, which, unfortunately, brought no return on the investment. The R-1/R-2 did not race in 1934. Just prior to the Nationals, pilot Roy Minor ran it into a drainage ditch on the Springfield airport and the damage could not be repaired in time for the races.

In 1935 the machine was acquired by a new owner-pilot, Cecil Allan, who undertook further modifications, including the construction of an entirely new and larger wing. Because of this and other changes, the Granvilles objected to the use of the name Gee Bee in connection with the aeroplane. Allan flew it to Los Angeles for the start of the 1935 Bendix race, but crashed and was killed on take-off. This tragic event ended the era of the Gee Bee racers. All of the special racers had been destroyed, and if any of the little Sportsters survived at this time, they were never again seen in a major air race. The Gee Bee firm, too, was gone, having become bankrupt and subsequently sold following Zantford Granville's death early in 1934. While there was to be one more aeroplane to carry on the name, it was neither a true racer nor a true Gee Bee.

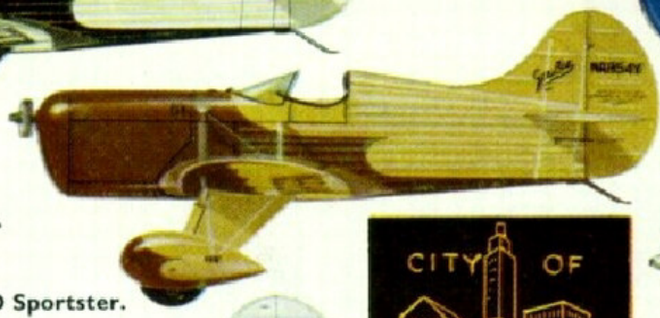
THE Q.E.D.

As a parallel to some schemes that the Granvilles had for developing a line of commercial aircraft out of their racers, a design for a long-range, high-speed two-seat sporting model known as the Q.E.D. (*Quod Erat Demonstrandum*, Latin for "So It Is Proven") was laid down in 1933 and completed in 1934. While usually called a Gee Bee, the Q.E.D. was completed after the demise of the company. It should properly be called a Granville, Miller, and DeLackner, after an engineering firm that Zantford Granville and some new associates had formed in 1933 while Granville Brothers Aircraft, Inc., was still solvent. In spite of the bankruptcy and sale of the Gee Bee firm, the

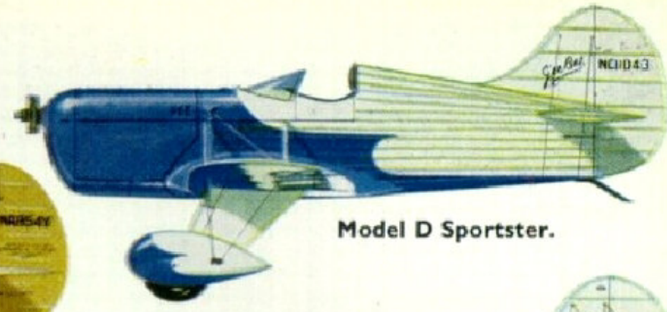
The Gee Bee products were not confined to the racers. Illustration shows the Model "A" two-seat biplane of 1929.
(Photo: A. U. Schmidt collection.



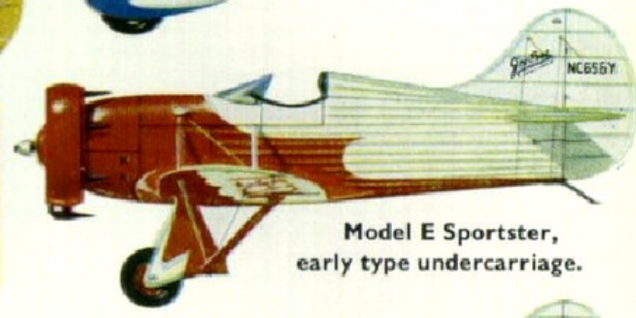
Model D Sportster, early type undercarriage.



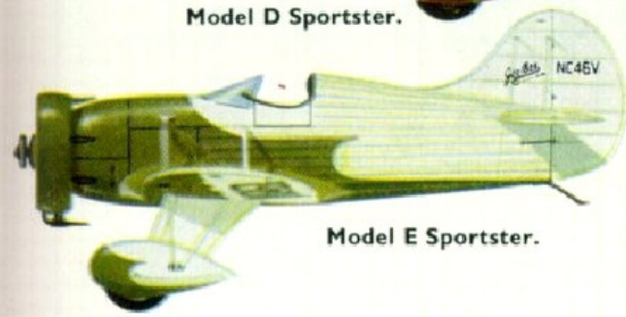
Model D Sportster.



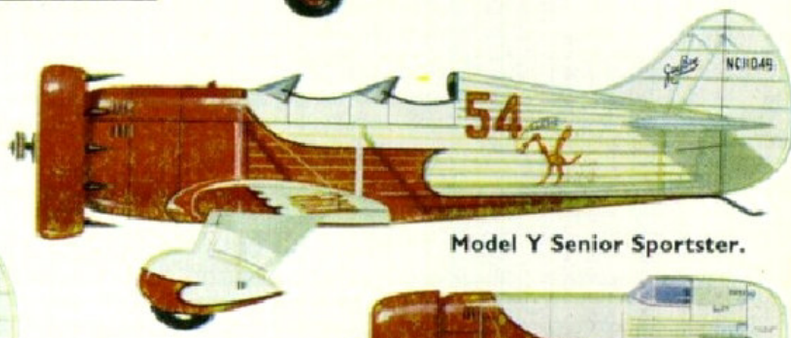
Model D Sportster.



Model E Sportster, early type undercarriage.

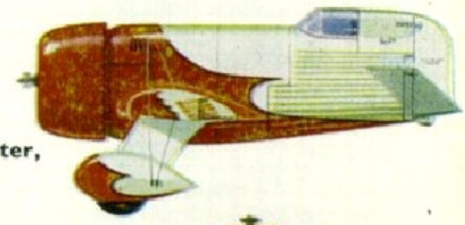


Model E Sportster.

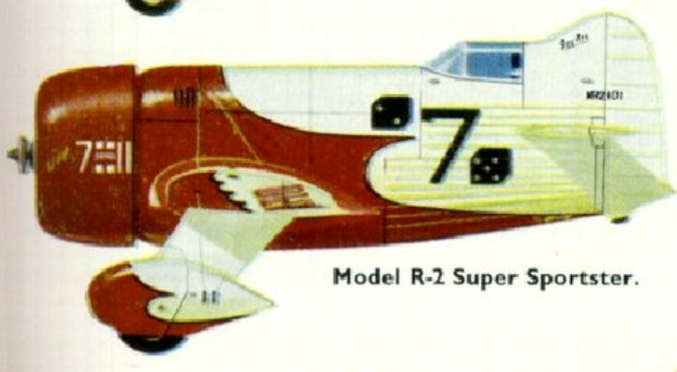


Model Y Senior Sportster.

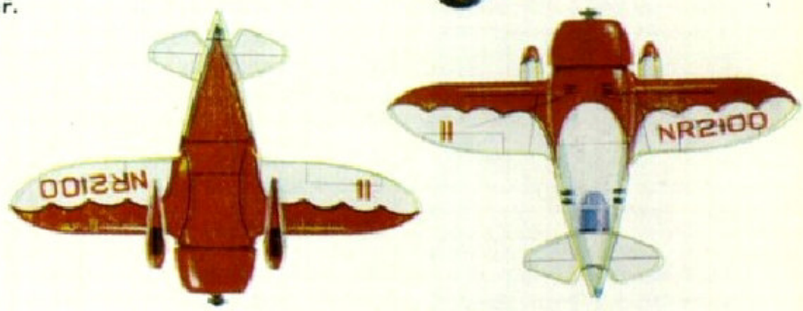
Model Y Senior Sportster as single-seater.



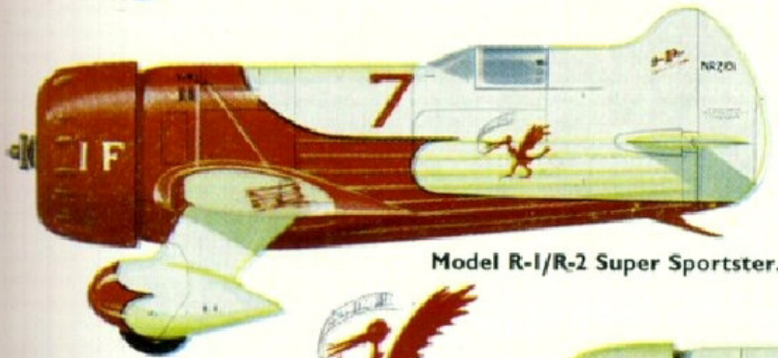
Model R-1 Super Sportster, original rudder.



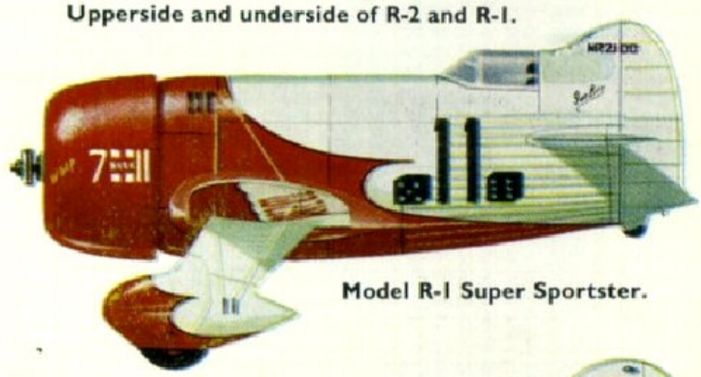
Model R-2 Super Sportster.



Upperside and underside of R-2 and R-1.



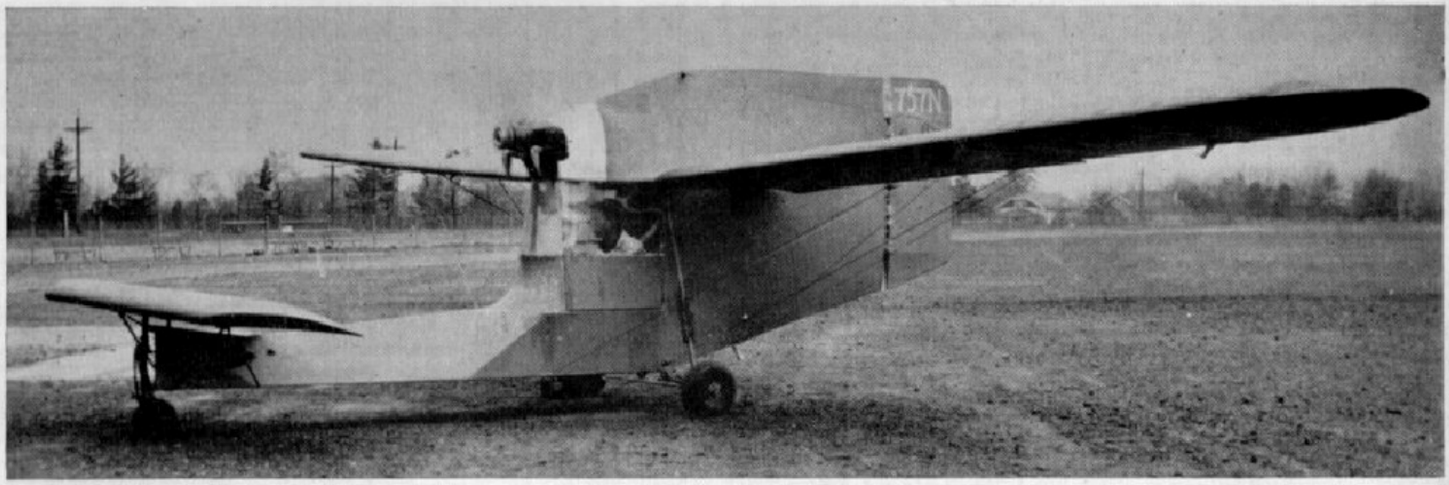
Model R-1/R-2 Super Sportster.



Model R-1 Super Sportster.

Model R-6H, NX14307, flown by Jacqueline Cochran and Wesley Smith in the MacRobertson Race, October 1934.

Model R-6H flown by Capt. D. A. F. Sarabia from Mexico City to New York, 2,350 miles in 10 hrs. 47 mins. on the 24th May 1939, crashing in the Potomac River on the return flight.



The unique "Ascender" of 1931, a canard design using the wing and powerplant of an Aeronca C-2 ultra-light sportplane.
(Photo: Courtesy Joseph P. Juptner)

Q.E.D. was completed by essentially the same personnel that had started it. Powered with a standard 675-h.p. "Hornet" engine, it was designed to meet commercial, rather than racing, requirements but showed that it was a true descendant of the famous Gee Bees in its lines and structure. A commercial career never materialised, and the Q.E.D. was entered in a number of major races. In all but one of these, it was greatly outclassed by the more specialised machines and cannot be blamed for not taking any first place honours. However, mechanical troubles conspired to give the Q.E.D. a most unique racing reputation—it never completed a single race that it entered.

The one race to which the Q.E.D. was suited was the unique MacRobertson race from England to Australia, held in 1934, and it had been designed with this event in mind. Before flying in that race, however, it was entered in the 1934 Bendix, which started in Los Angeles. Pilot Lee Gehlbach was forced down with cowling trouble at Des Moines, Iowa, and arrived at Cleveland too late to place. The Q.E.D. was not entered in any of the pylon events that year. It fared little better in the MacRobertson even though it turned in a very creditable performance by flying non-stop from Mildenhall, England, to Bucharest, Rumania. Mechanical troubles at that point kept pilots Jacqueline Cochran and Wesley Smith from continuing. The 1935 Bendix again started in Los Angeles with the Q.E.D. on hand. The jinx prevailed, and pilot Royal Leonard made it only as far as Wichita, Kansas, before being forced down by engine trouble.

In 1936, the big green two-seater was entered in the Thompson Trophy Race at Los Angeles but was forced out by engine trouble after completing 10 laps of the 15-lap course. It was not entered in any race in 1937 but did try for the Bendix again in 1938. The "Never Finish" jinx ran true to form and pilot George Armistead was forced down at Winslow, Arizona, by a combination of weather, radio, and powerplant troubles before the race had got well under way.

While this misfortune ended the formal racing career of the last of the Gee Bees, it was not quite the end of the line. One of Mexico's most famous pilots, Francisco Sarabia, bought the Q.E.D., repainted it, and placed it under Mexican registration. At first, it seemed that the change of ownership had broken the jinx, for Sarabia set a new record for a non-stop flight from Mexico City to New York City on 24th May 1939, covering the 2,350 miles in 10 hours and 47 minutes. The jinx prevailed, however, for on his return flight, starting from Washington, D.C., Sarabia was killed when the engine quit on take-off. A rag left inside the cowling had been sucked into the carburettor, choking the engine.

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SPECIFICATIONS

	Model "X" (D)	Model "Y"	Model "Z"	Model R-1 (1932)	Q.E.D.
Span	25 ft.	30 ft.	25 ft. 6 in.	25 ft.	34 ft. 3 in.
Length... ...	16 ft. 5 in.	21 ft.	15 ft. 1 in.	17 ft. 9 in.	27 ft. 2 in.
Wing area ...	95 sq. ft.	138 sq. ft.	75 sq. ft.	—	211 sq. ft.
Weight, empty	870 lb.	1,400 lb.	1,400 lb.	1,840 lb.	3,144 lb.
Loaded ...	—	—	2,280 lb.	3,075 lb.	6,500 lb.
Powerplant ...	American Cirrus 110 h.p.	Lycoming R-680 215 h.p.	P. & W. Wasp Jr. 535 h.p. (SPL)	P. & W. Wasp 80 h.p. (SPL)	P. & W. Hornet 675 h.p. (Normal)
Max. speed ...	145 m.p.h.	160 m.p.h.	270 m.p.h.	300 m.p.h.	300 m.p.h.
Cruising ...	125 m.p.h.	135 m.p.h.	230 m.p.h.	—	—
Landing ...	50 m.p.h.	55 m.p.h.	80 m.p.h.	—	—
Range	—	—	1,000 miles	—	—

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